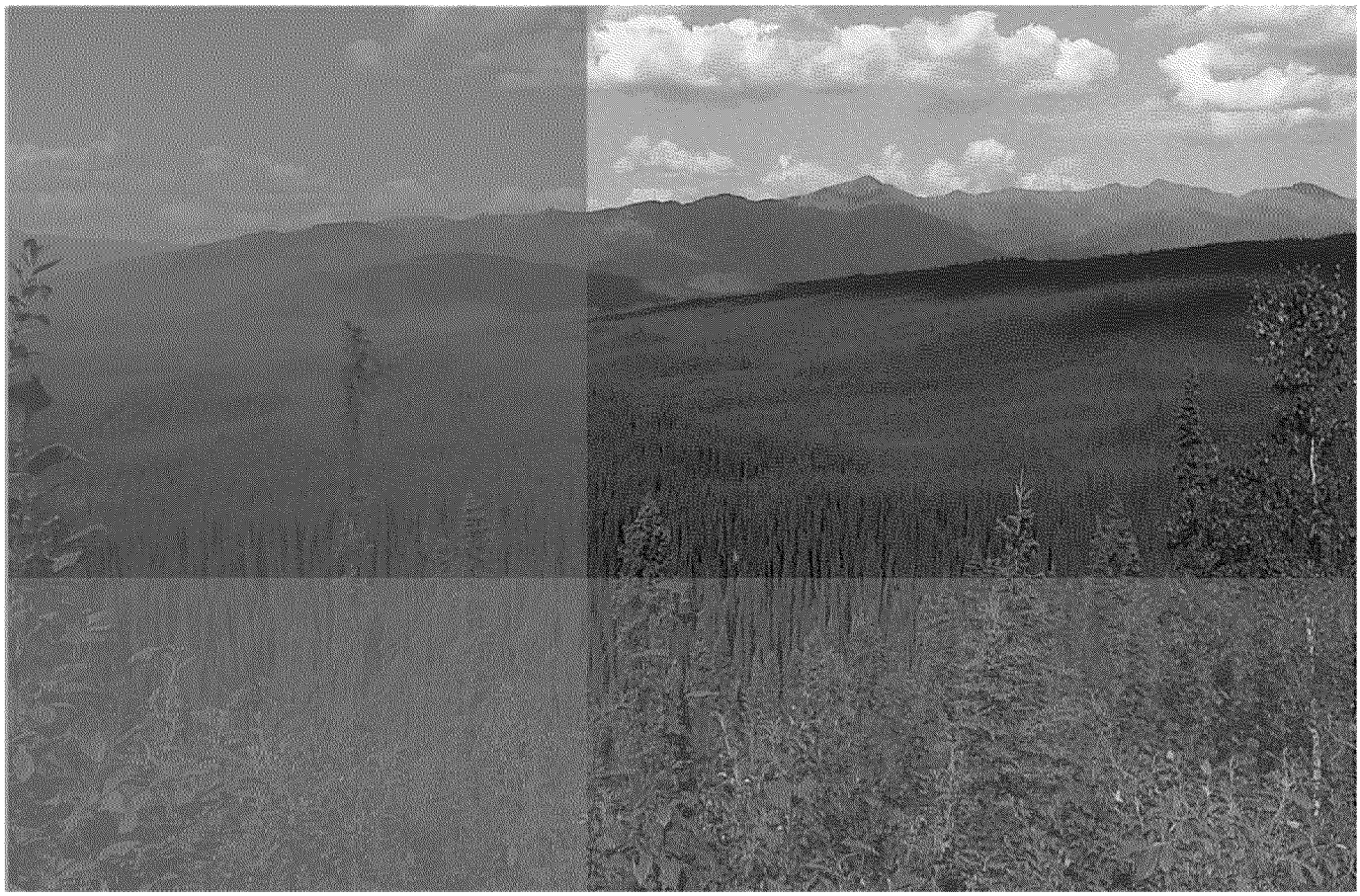
ALEXCO ENVIRONMENTAL GROUP (US) INC.

RESPONSE TO REQUEST FOR PROPOSAL

INSTALLATION, OPERATION AND MAINTENANCE

INTERIM WATER TREATMENT PLANT (IWTP)

GOLD KING MINE DRAINAGE, GLADSTONE COLORADO



PREPARED FOR:

ENVIRONMENTAL RESTORATION LLC

UNDER A TIME CRITICAL EMERGENCY RESPONSE
ACTION FOR US EPA REGION VIII

AUGUST 2015

ALEXCO ENVIRONMENTAL GROUP

ALEXCO ENVIRONMENTAL GROUP (US) INC: RESPONSE TO RFP

INSTALLATION, OPERATIONS AND MAINTENANCE OF THE IWTP AT GOLD KING MINE

August 2015

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ENVIRONMENTAL RESTORATION LLC

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APPENDICES

1 INTRODUCTION AND PROPOSAL ORGANIZATION

In response to the Request for Proposal for Design, Construction, Installation, Operations and Maintenance of an Interim Water Treatment Plant (IWTP) at Gladstone, Colorado, Alexco Environmental Group (US) Inc., has developed this approach to attain treatment objectives in a cost effective manner at the Gold King Mine site (Site). Specific consideration has been focused on optimization of treatment process to provide a robust treatment system capable of achieving the chemistry goals in a cost effective manner. Some of the optimization issues that we have considered include a need for manganese removal to avoid staining or color development in the discharge area which requires elevated treatment pH (between 10 and 10.5 typically). This target pH is somewhat in conflict with stringent treatment standards for cadmium removal. Alexco anticipates that treatment capacity at a reactor pH of between 10-10.5 will attain 3.2 ppb Cd but the pH setpoint will be field optimized to attain the ARARs and still meet the schedule requirements. If necessary in the future a dosing and second clarifier module could be added at the back end of the proposed clarifier to add calcium polysulfide for cadmium removal if a lower standard was determined to be required.

This proposal is organized as follows:

- Section 1 introduces AEG as a company, its locations, and the expertise and experience that we bring that will make our installation of the IWTP at Gold King Mine a success.
- Section 2 provides details of the project personnel that are available to procure, install, and successfully commission the IWTP at Gold King Mine.
- Section 3 provides a proposed design of the IWTP facility, specifically addressing the design components requested in the RFP.
- Section 4 provides details of the mobilization, procurement, construction and installation, commissioning and shakedown, transition to and performing IWTP operations and maintenance (O&M), and demobilization, including a section on how AEG will meet the time-critical schedule of a fully functioning IWTP in 21 days.
- Section 5 provides project examples where AEG has or is performing similar projects.

1.1 ABOUT AEG

Alexco Environmental Group (US) Inc. ("Alexco" or "AEG") is the Technical Manager and Proposal Proponent for the RFP. We have two offices in Colorado, including one located in the Denver Technical Center near the Centennial Airport and another in Fort Collins. AEG also has personnel and project offices in several other locations in other states in the US (Louisiana, New Mexico, and Washington). We have several active treatment facilities and project sites in Colorado, including the Globeville Smelter clean-up site in north Denver, the Schwartzwalder Mine water treatment site near Golden, the London Mine water treatment facility near Alma, and intermittent support for the Platoro Mine water treatment facility near Platoro. Alexco also has operated two projects in the US in support of US EPA, specifically one site undergoing emergency response (Barite Hill Mine in Region 4; Leo Francendese, OSC) and AEG personnel supported water treatment evaluations at Gilt Edge Mine in Region 8 (Ken Wangerud, RPM). AEG personnel are familiar with the CERCLA process, and have worked cooperatively with US EPA most recently at the Globeville site to optimize and implement the site

remedy. In addition, AEG has on many occasions worked with EPA Region VIII approaches for in situ mine water treatment under the UIC program.

AEG also has three offices in Canada - Vancouver, Whitehorse, and Toronto. AEG currently operates five water treatment plants in the former United Keno Hill Mine district in the Yukon on behalf of Aboriginal Affairs and Northern Development Canada (AANDC) and a sixth water treatment plant at the Bellekeno Mine location on behalf of Alexco Resource Corporation, AEG's parent company. This flagship project located in Keno, Yukon, is AEG's largest project, where AEG has provided water treatment services for mine water very similar to Gold King Mine water. These servicesinclude process optimization,automation, and creation of process redundancy to assure 100% compliance; care and maintenance of the treatment facilities; and leading a multi-party closure planning process with participation with the Government of Canada (AANDC), Yukon Government, and the First Nation of Nacho Nyak Dun. Ultimately this cleanup project will be over $100 million and will include extensive reclamation of tailings and waste rock sites, as well as construction and operation of both active water treatment (lime coagulation and clarification) and in situ mine water treatment.

AEG has approximately 50 scientists, engineers and professionals with strong local regulatory and technical expertise which is built on a long history of developing relationships, working within the regulatory framework, and conducting field engineering and environmental site services and projects in Colorado, throughout the United States, and in Canada particularly focused in the subarctic Yukon. Our team is known to the community and regulators, and has carefully maintained our credibility and our brand.

AEG has developed several innovative approaches for mine water treatment that work with active treatment systems. To this end, Alexco has received over ten Underground Injection Control permits for mines or mining impacted waters in Region VIII US EPA. Our focus in this area of in-mine pool treatment and chemistry management of mine waters in-situ should provide opportunitiesto substantially reduce operating and capital costs at this Site. AEG senior management also has a background and experience base in mine operations and management, having designed, built, operated andclosed numerous open pit and underground mines across North America. This mine operations experience and culture of AEG brings a unique advantage on our approach to addressing environmental remediation challenges.

2 AEG PROJECT PERSONNEL

The success of this time-critical project is driven primarily by the team AEG will provide, and especially its leadership.

As **Project Director**, Mr. Joseph Harrington will ensure technical quality of the WTP and that the diverse components work together to achieve treatment objectives and the schedule. Mr. Harrington has managed the CERCLA driven cleanup process for the past decade at the former ASARCO Globe Smelter (Globe) in north Denver and Adams County, developing and ensuring the highest quality in implementation of strategies to meet the site remedial goals. The core of the team that is proposed for this project has recently delivered on the Globeville project, as well as the Cotter Schwartzwalder and Barite Hill projects.

As **Project Manager**, Mr. Eric Lancaster will lead the project engineering, the specification and procurement of equipment. Mr. Lancaster will be the day to day liaison with Environmental Restoration LLC regarding the overall project schedule, coordination with the construction teams and procurement of subcontractors. Mr. Lancaster is a Senior Project Manager for AEG, is a registered Professional Engineer (Colorado and Yukon) and holds a Class C Water Treatment Operator license in Colorado. Mr. Lancaster has managed the project aspects in a team approach with Mr. Harrington on many of these projects for Alexco since 2009, including Globeville, Barite Hill, and Cotter Schwartzwalder. Mr. Lancaster has also designed and implemented remote monitoring and remote control technologies for nine water treatment plants in the Yukon and Colorado.

As **Construction Manager,** Mr. Peter Johnson (B.S. Aerospace Engineering) is a Senior Engineering Construction Manager with AEG, and will lead the on-site construction team, responsible for site coordination and all aspects of equipment mobilization, installation of water treatment equipment, electrical coordination, and shakedown of the treatment plant in preparation for transition to O&M. Peter has provided construction management for the Alexco Galkeno 300 WTP upgrade (see Section 5), the construction oversight of the mechanical, civil, and electrical components for the $25 million Galkeno mill project for Alexco, and has served as the Care and Maintenance Manager for the UKHM district for over 6 years.

Mr. Harrington, Mr. Lancaster, and Mr. Johnson will be supported by a project team that has worked together installing similar systems. The AEG project implementation team will include:

- Rey Rodriguez (B.S. Mechanical Engineering)
    - Rey served as Site Manager for the Globe Smelter cleanups and will be available full time for the installation and operations of the IWTP.
- Patrick Delaney (B.S. Environmental Engineering, Class D Industrial Wastewater Operator)
    - Currently overseeing the London Mine water treatment plant installation and operations and available as a relief operator to Rey Rodriguez. Patrick will support the procurement of reagents, materials, and laboratory supplies so that the IWTP will be fully functional when the installation has been completed.
- Ken Boldt P.E. (B.S. Civil Engineering)

- Ken is a civil engineer that will support Eric Lancaster in thedesign and documentation of the IWTP.

- Mike Tzareff (Class A Industrial Wastewater Operator)
  - Currently located full-time at Coors WTP in Golden, with part-time support to Alexco specific to the Schwartzwalder Mine project. Mike has agreed to provide support for process optimization and automation.

- David E. Sanger (Maintenance Superintendent, 35 years' experience, welder/field fabricator)
  - Dave was smelter maintenance superintendent at ASARCO for 30 years and has worked for Alexco since 2010. Dave was integral to the installation of both the Globeville and Cotter WTPs. Dave is available full time to oversee the installation of the IWTP components especially related to plumbing, pumps, and structural components.

- Jim Lancaster (paramedic, ambulance service operations in San Luis Valley, health and safety on site coordinator)
  - Jim is available during the construction phase to provide safety oversight and emergency medical support to the installation team for this RFP. Jim works for Alexco on a seasonal basis, lives in Monte Vista, and oversaw all the safety aspects of the Platoro water treatment seasonal campaigns in each summer of 2009-2013. He also oversaw safety during the construction of the Globe treatment plant in January 2011.

2.1 KEY SUBCONTRACTORS

The following subcontractors are identified for providing either materials/equipment or specialized labor resources for the construction of the Gold King IWTP:

- Electrical services will be provided by Precision Electric & Supply of Denver and by Alpine Electric in Alamosa.

- IWTP Building provided by Sprung Instant Structures, Inc. in West Jordan, Utah.

- Clarifier provided by Waste Treatment Equipment Specialties, Inc. (WESCO) in Pennsylvania.

- Horizontal lime storage silo ("guppy") provided by Deep South Trailers in Texas.

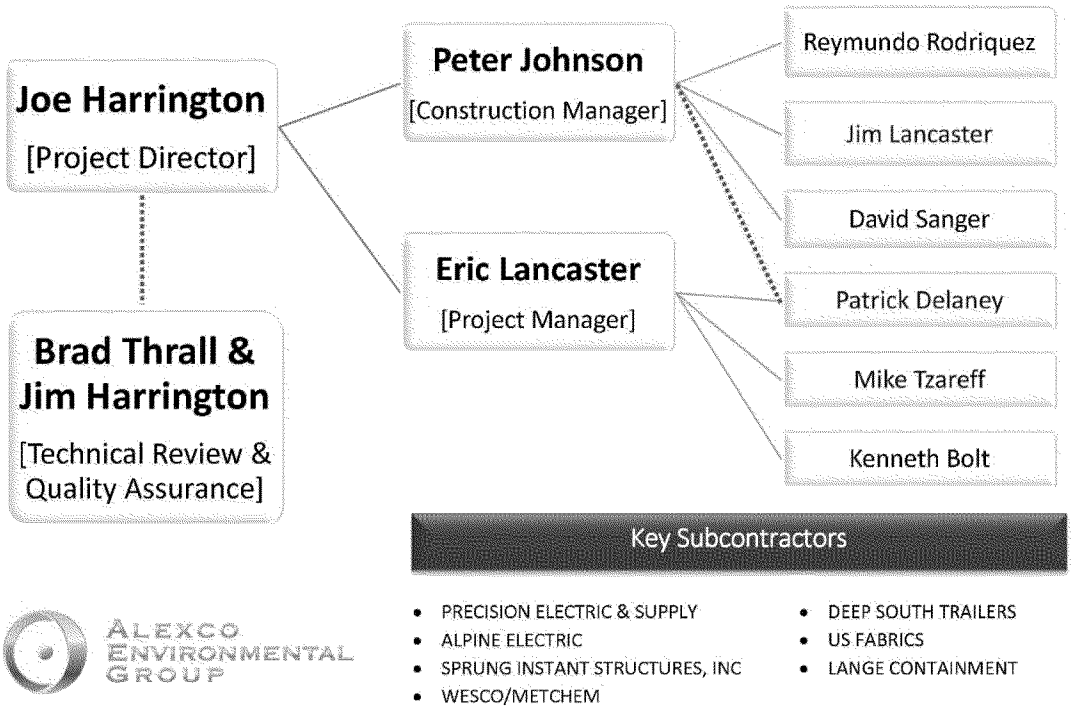
- Geotextile bags for sludge consolidation provided by US Fabrics in Cincinnati Ohio.

- Liner for the sludge consolidation area provided by Lange Containment in Denver.

2.2 AEG PROJECT ORGANIZATION STRUCTURE

The following organizational chart summarizes the proposed AEG management, supervision and labor support structure for the Gold King project.

Project Team Organization Chart



ALEXCO ENVIRONMENTAL GROUP

Key Subcontractors

- PRECISION ELECTRIC & SUPPLY
- ALPINE ELECTRIC
- SPRUNG INSTANT STRUCTURES, INC
- WESCO/METCHEM
- DEEP SOUTH TRAILERS
- US FABRICS
- LANGE CONTAINMENT

3 PROPOSED GOLD KING IWTP DESIGN

AEG has carefully considered the water chemistry provided in At tachment G, and the characteristics of the desired effluent described in RFP section 3.3. We believe thata lime coagulation system, using a single oversize lamella clarifier for sludge separation, and sludge solidificat ion in geotextile back provides a simple, robust system that will be easily managed. By providing automation, pH, and turbidity controls, the plant can be adjusted both automatically within setpoints to achieve target pH, as well as on site and remotely by O&M operators.

AEG has experience operating several similar facilities, and based on that experience, weare confident that the plant design will achieve:

- Neutral pH effluent <6.0, >9.0
- Dissolved solids will be reduced by removal of metals and formation of metal hydroxide sludge.
- Total solids will be reduced by coagulation, flocculation, and settling through the clarifier.
- Color is currently caused primarily iron oxidation, and staining is caused both by iron and manganese in the mine water forming precipitates on rocks and in sediments. The treatment process will remove both iron and manganese by more than 90%, reducing the potential for color.
- For metals of concern, the treatment process typically removes metals between 95% and 99%.

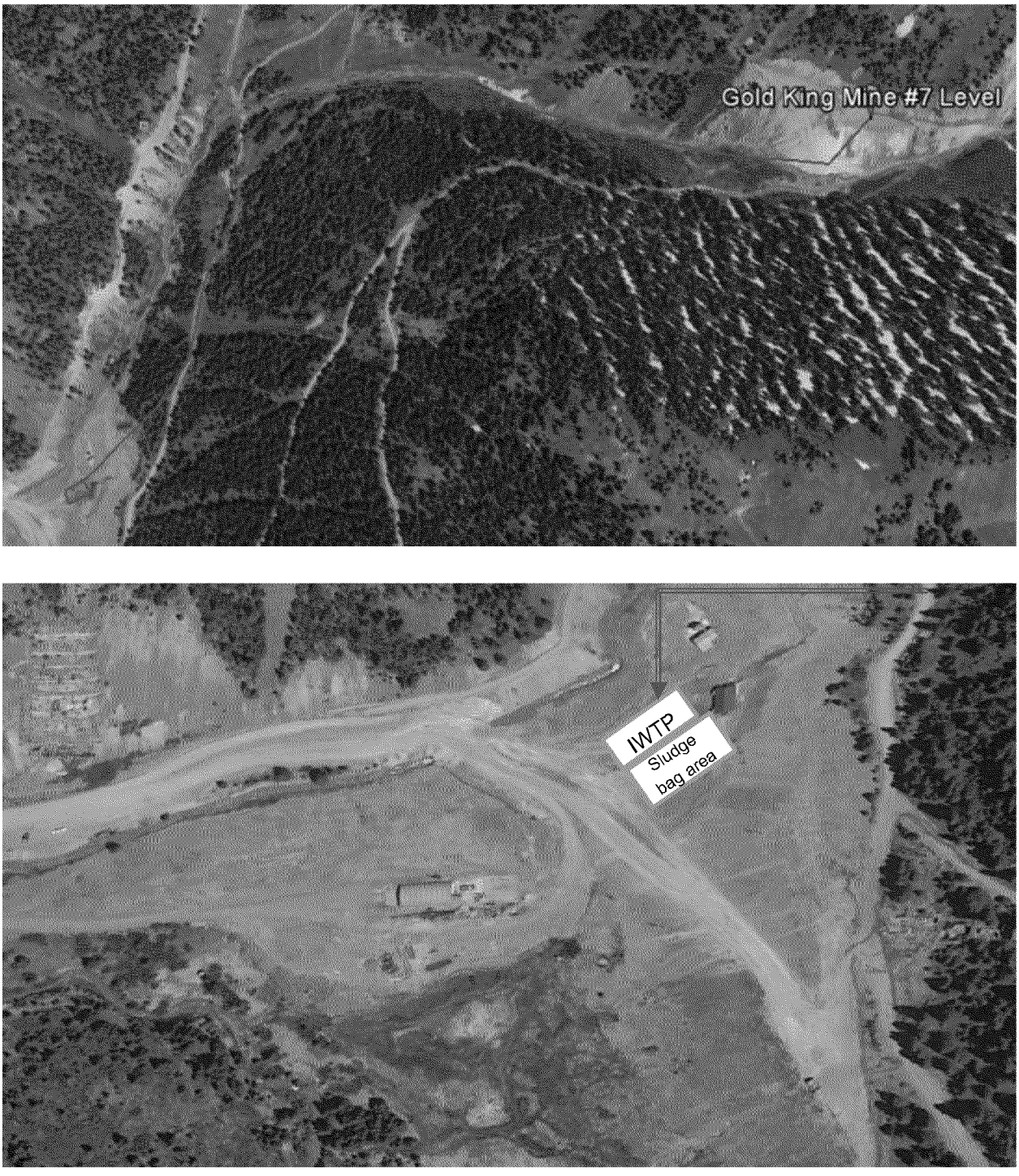
3.1 PROPOSED TREATMENT SYSTEM DESCRIPTION

AEG proposes the following design:

Site Footprint and Access: the site footprint requirements will be approximately 200 x 250 Access for a semi-trailer for lime delivery and to haul sludge away will be required.

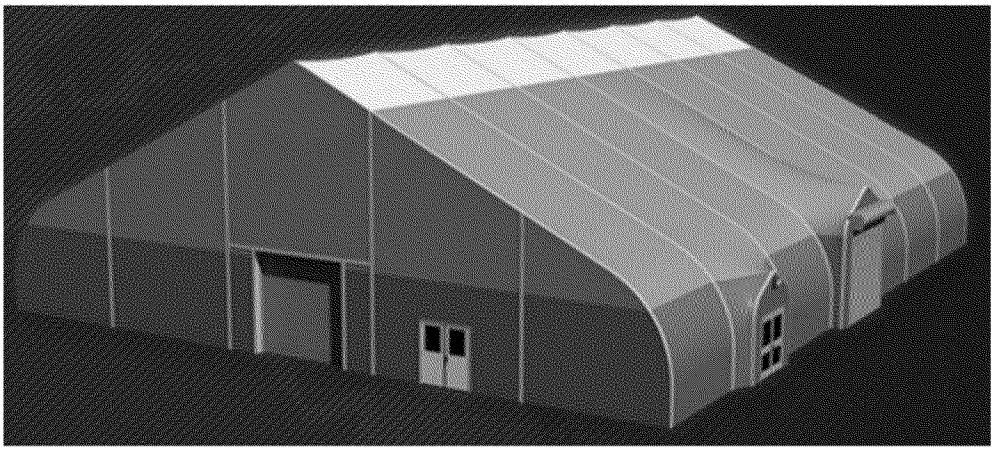
Plant Location: The following figures document AEG's understanding of the flow path of water from the Gold King Mine to the IWTP treatment location, and the approximate location and footprint for the plant and sludge handling areas.

Figure 1. Approximate water flow path to the IWTP. Approximate elevation of treatment facility is 10,500'.



Building: The IWTP will be housed in a Sprung™ structure of approximately 5,000 square feet with a central area roof height of at least 23 feet to accommodate a 19 foot tall clarifier. A lined area of 50 feet by 250 feet will be used to provide for sludge settling outside and adjacent to the building to hold the sludge geotextile bags. The building will be fully erected 17 days after NTP.

Figure 2. Example Sprung Structure.

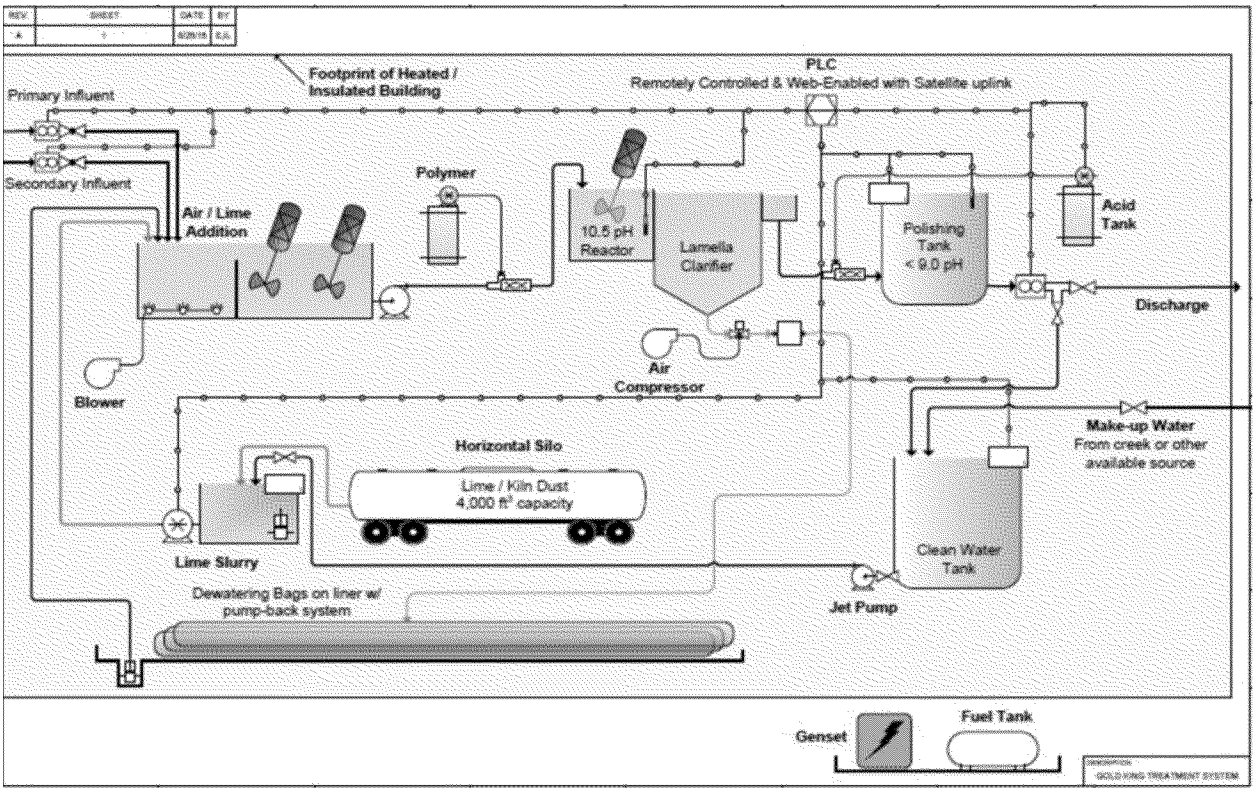


Building Floor: The floor of the building will be compacted gravel. The area where the filter bags are set up will be lined with HDPE which will be sloped to a sump that will be pumped as needed to the reactor tank. The clarifier will sit on a concrete pad 12" thick, and sized to 30 ' x 12' recessed in the ground to a depth of up to 2 feet.

Flow Rating: The proposed IWTP will be rated by the mix tank and clarifier, which are rated to 1,000 gpm and are capable of accommodating surge flows of up to 1200 gpm. Al l flow in will be plumbed in 6 inch HDPE; internal to the IWTP will be all 8" HDPE including discharge to allow this hydraulic design flow.

Process Flow Diagram: The figure below shows the process flow diagram that AEG prop oses to utilize for the Gold King Mine IWTP.

Figure 3. Gold King IWTP Process Flow Diagram.



Reactor Tank: The mix tank will receive lime to neutralize the water and fo rm metal hydroxides. The tank will be aerated with a blower to fully oxidize all iron and manganes e, which will occur rapidly at the design pH range of 10-10.5. The reactor tank is rated to provide over 30 minutes of agitation and aeration at 600 gpm, at at 1000 gpm will provide 20 minutes of reaction time.

Flocculent Tank: a small flocculent addition tank with a mechanical agitator i s attached to the clarifier prior to underflow into the clarifier.

Clarifier: The clarifier (Parkson) 1000 GPM (2600 SF settling area lamel la – type) dictates the height of the building and stands 19 feet. The design of this clarifier is oversized for normal flow ranges, providing substantial water quality benefits for removal of suspended sol ids. Additionally in the event of a sustained surge at 1200 GPM Alexco has operated geotextile bags to provided supplemental filtration.

Figure 4. Photo of proposed clarifier.

Sludge Handling: Underflow from the clarifier will be pumped to a series of geotextile filter bags, which provide sludge dewatering by passive gravity settling in high surface area bags. The sludge settling area will include lined areas inside and outside the Sprung structure to assure that even in extreme cold that sludge will continue to be handled. AEG has successfully operated these sludge geotextile bags in temperatures as low as -20 °F. The sludge handling required by ER will begin once the geotextile bag is full of sludge and the drainage from the bag self-pressing has ceased. The bag will then be split open and the sludge moved into a dump truck or covered roll-off bin, as needed, and disposed as decided by ER. The sludge will be solid and will be capable of being loaded by a skid steer or front loader. Approximately 3,000 cubic yards of sludge approximately 50% solids or greater are anticipated to be formed and require handling by ER per year.

Design redundancy: AEG has included the following the following design redundancy to make the IWTP capable of responding to higher flow or changing chemistry conditions:

- Both 6" flow lines will be plumbed to the reactor tank to accommodate redundant flow sources.
- The proposed design flow for the clarifier (1000 gpm) is oversized for base flow.
- Sludge settling bags are included both within the Sprung ™ structure as well as in an adjacent open area, to accommodate low temperature events, and the sludge manifold will be built to accommodate higher sludge production rates than anticipated.
- All major equipment except the clarifier will have a redundant spare plumbed in and ready to go, including:
    - Blowers
    - Mixers for lime mix tank
    - Sludge blowdown transfer pumps
    - Treatment pH probes
    - Peristaltic pumps for lime dosing, flocculent dosing, and acid dosing

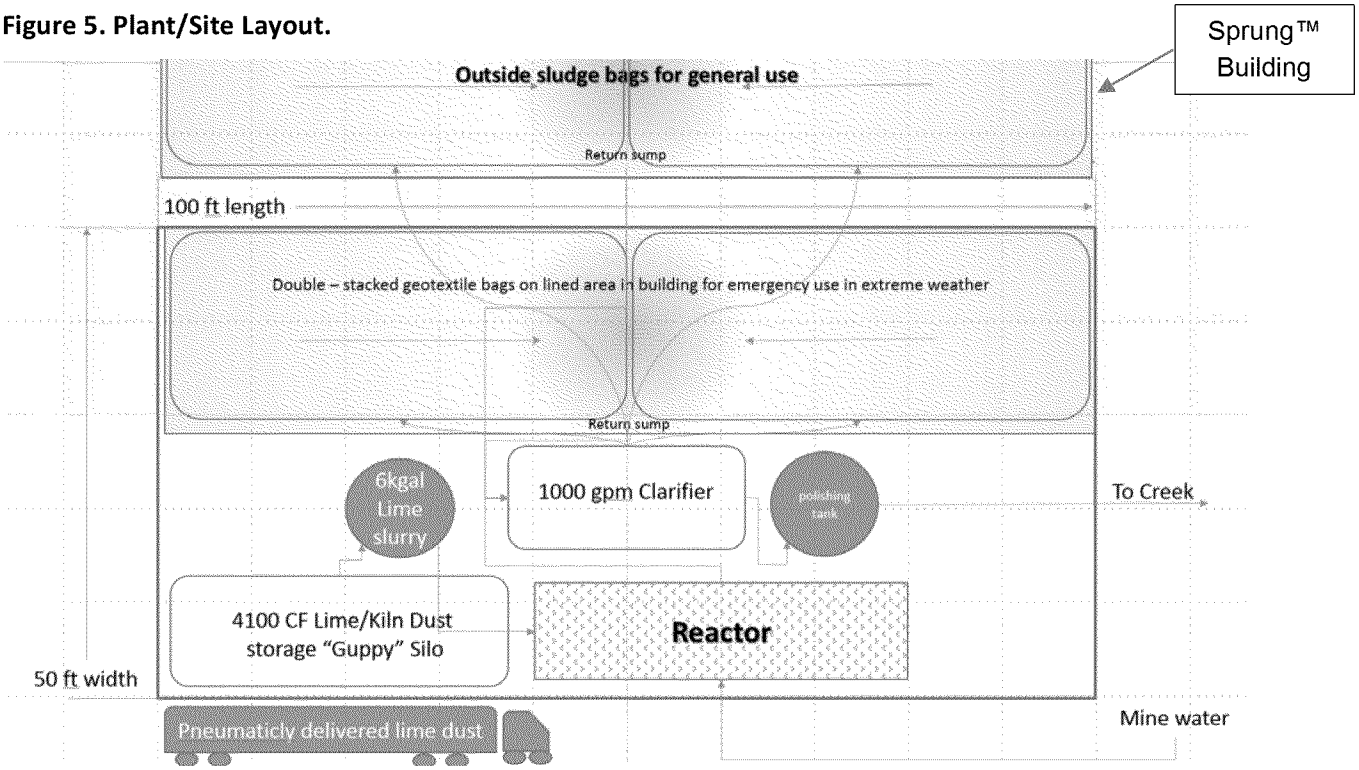
These redundant and oversize components provide assurance that in high flow events the IWTP will still achieve the discharge objectives. In low flow conditions, the clarifier will simply provide better settling; flows down to 200 gpm will not be problematic for treatment efficiency.

a. expected waste solids and containerization requirements

b. Status of construction for equipment—what needs to be built, what is available now)

Plant Layout: The following schematic illustrates the anticipated layout of the major features of the IWTP.

Figure 5. Plant/Site Layout.



Equipment availability: AEG has selected equipment that is all ready to be shipped as soon as notice to proceed is given. This includes all building, pipes, tanks, blowers, mixers, laboratory equipment, pH meters, clarifier, sludge bags, etc.

Power: All power will be provided by a 480 V, 25 KVA generator, with double-contained fuel storage.

Operating Philosophy: AEG has designed the Gold King plant to automatically respondto changes in flow and chemistry. A pH probe in the reactor will provide real-time pHreadings to the PLC, allowing for adjustments to the lime addition pump(s) to maintain a treatment set point. After water passes from the clarifier, it will enter a polishing tank where pH levels will again be real-time monitored and adjusted via the PLC with an acid pump maintaining discharge pH standards. The treatment system will be outfitted with flowmeters/totalizers to monitor flow rates and total treatment volumes. In addition, level sensors will be used to monitor reagent tank levels.

The selected PLC allows for the selection of "LOW", "LOW LOW", "HIGH", and "HIGH HIGH" alarm settings for each input. When these levels are triggered, an alarm e-mail is sent to up to eight employees for notification that the system may be experiencing an upset. As stated earlier, pH levels will be continuously monitored in the reactor prior to settling, and in the polishing tank prior to release. The pH probes will be calibrated weekly by the site operators and ensured to be in good working condition.

Reagents: The site will utilize powdered lime, liquid polymer, and acid as treatment chemicals. The powdered lime will be delivered to site in pneumatic trucks that will be off-loaded to the horizontal storage silo. Polymer will be delivered to site in 55 gallon barrels where it will be mixed at 0.5% - 1.0% strength within the polymer tank. Acid will be delivered to site in 275 gallon totes and used for pH adjustment at the polishing tank.

Discharge Targets: AEG anticipates discharge of 0.3 mg/L Zn, 3.2 ppb Cd and less than 4 mg/L Mn, within a range of 6.5 – 9.0 pH. These are the key parameters that we designed the plant to achieve. Alexco is currently operating the London Mine WTP, and several treatment plants in the Keno Hill district, and we are achieving these targets on a consistent basis.

Plant Construction Labor and Subcontractors: Alexco intends to use both local and mobilized manpower in the build of the treatment facility. During assembly, several key operators and supervisors will be mobilized from south Denver, with additional staffing provided from Monte Vista, Silverton, and surrounding communities as available. Local operator(s) will support the initial build and subsequent operation of the facility.

O&M: AEG proposes to conduct O&M for the IWTP. If we are not requested to provide O&M, Alexco managers (Joe Harrington or Eric Lancaster) are available 24/7 to answer questions for the first two months. Also, the satellite uplink that will be installed will make remote operation possible without overnight operators.

ER will have direct access to Joe Harrington (design and O&M expert) and Eric Lancaster (remote monitoring and PLC programming) for consultation regarding process and operations, with additional support by Patrick Delaney for PLC operations support.

Requested ER support: The only support that is anticipated to be required of ER is the mine water influent line to the treatment facility. We understand that ER is providing site grading for building footprint and plant layout area. We understand that ER will also provide grading for snow removal and will provide communication of any known upsets coming from Gold King

Treatment monitoring: Alexco will mobilize and install a 12' x 56' office and laboratory facilities in support of sampling and testing.

3.2 AEG SUSTAINABILITY APPROACH

AEG has considered the constraints of this time-critical project, and has incorporated a sustainability approach both in the design of the plant, and will incorporate the following practices in the construction project.

a. AEG will utilize vehicles with cleaner fuels, and will utilize no-idle practices as possible.

b. Minimize distances traveled, by procuring locally and where possible using local vendors. The design of the sludge consolidation system will enable more efficient campaigns to dispose of sludge in good weather only. This will reduce road maintenance requirements and haulage. Alexco anticipates identification of a beneficial re-use of the sludge in the immediate area.

c. Equipment in the IWTP will include lower energy consumption lighting, and will utilize environmentally friendly lubricants where possible. The design of the plant eliminates a filter press which is typically a large component of the energy and labour required in similar WTP installations.

d. AEG will utilize electronic monitoring, data storage, and remote controls on plant operations to minimize paper storage requirements, and substantially reduce operating costs.

4 PROJECT SPECIFIC REQUIREMENTS

4.1 MOBILIZATION

The scope of AEG mobilization includes the following items:

- Development of Health and Safety Plan from existing templates from other sites (note additional discussion in Section 7).
- Development of Contingency Plans
  - Spill Prevention, Control, and Countermeasures Plan
  - Pollution Prevention Plan

AEG will procure, furnish, mobilize, and stage all equipment and materials necessary to construct the water treatment facility. Mobilization is anticipated to be completedin the first 7-10 days for all major equipment and plant materials.

4.2 SYSTEM INSTALLATION, SHAKEDOWN, DEMONSTRATION OF AUTOMATED OPERATION

AEG will begin system installation as soon as equipment and materials arrive on site. A detailed construction project schedule will be developed as soon as notice to proceedis given and orders are placed. This will include timing of subcontractors and AEG installation personnel.

4.2.1 System Installation

AEG will obtain local, state, federal, other permits as required. With the timing of the IWTP, AEG anticipates that no major permits will be required.

AEG will participate in site meetings, including daily progress meetings reviewing project status, schedule, impacts to schedule, discussion of plan to complete work and any actions that need to be taken to remedy delays.

As described in Section 3, AEG will procure and install a building/structure to allow for operation year-round. The building will have a compacted, gravel floor with a concrete slab for the clarifier, with a storage room for floc, acid, and any other required chemicals. AEG will provide a lab trailer for on-site testing of pH, turbidity and color, and suspended solids.

AEG will perform the treatment equipment installation, including plumbing in to the lines provided by ER into the reactor tank, plumbing from the reactor tank into the floc tanks and clarifier, and plumbing from the clarifier into the equalization tank and to discharge. AEG will install the horizontal lime silo, the lime solution tank, and mixing systems, as well as plumbing of the lime tanks into the reactor tank system.

AEG will install the flocculent tank and mixing system, and the pumps for flocculent addition into the floc tanks. AEG will also provide an acid storage tank and dosing system to provide pH adjustment in the equalization tank.

AEG will provide senior personnel for the design, construction oversight, and technical oversight of plant construction. The AEG team has significant senior level redundancy for treatment plant commissioning, operations, and troubleshooting, and all of the AEG resources will be available to help achieve the time schedule, providing insights to troubleshoot issues as they arise. AEG also has extensive relationships with suppliers, consultants, and other industry people to provide additional feedback as needed as issues arise.

AEG will install power utilizing an appropriately sized generator to allow all systems to operate. AEG will also install winterization / insulation outside and at juncture of plant with outside. AEG will stock the plant with materials and supplies necessary to operate the plant and provide inventory of critical spares.

AEG will provide weekly schedule update/reporting by written email reports to ER PM.

All AEG workers OSHA compliant including HAZWOPER training for all on-site workers.

4.2.2 Commission / Shakedown Treatment Facility, Demonstrate Successful Operation

AEG will work with ER to transition the site from current interim treatment to the new treatment facility. AEG will operate the systems, trouble shoot operations, until system is running as designed and meets acceptable effluent (as defined in Section 3.1 of this proposal)

AEG will participate in a Final Inspection by and to the satisfaction of ER Response Manager, and will address and correct any deficiencies identified. AEG will train workers to operate facility, and create and provide an O&M manual including:

- System design details
- Labor requirements
- Maintenance procedures and schedules
- Materials source information

4.3 OPERATIONS AND MAINTENANCE

During the AEG O&M phase, AEG will provide OSHA compliant O&M operators, an O&M supervisor, provide materials necessary for plant operation, provide equipment necessary for plant operation, and provide 24/7 phone support. If ER decides to provide O&M themselves, AEG will continue the O&M support until ER operators are comfortable with system operation, and will continue to be available to provide 24/7 phone support for no additional cost for two month after site transition.

4.4 DEMOBILIZATION

AEG will remove and demobilization all construction equipment, as well as remove all rubbish, trash, garbage, and construction debris, and dispose of these materials in appropriate landfills or provide for their reuse.

4.5 PROJECT SCHEDULE

- Project Award "Notice to Proceed" by 8/31/2015
- Mobilization of all materials and equipment by 9/10/2015
  - Horizontal Lime Silo
  - Reactor / Clarifier
  - Liners
  - Lime Slurry Tank
- Construction complete 09/20/2015
- Shakedown of system 9/27/2015
- Demonstration of meeting discharge specifications 9/21/2015
- O&M period 9/21/2015 – minimum of 4 weeks but AEG can operate as long as needed
- Construction Phase Demobilization, site cleanup 9/30/2015
- System Complete with Delivery of O&M Manual 10/7/2015.

We are anticipating 10 – 12 hour work days and no holidays impacting the schedule. All employees will work through the holiday weekend (Labor Day). The only item impacted by rainfall would be concrete placement which we anticipate on September 4th 2015. If rain occurred that delayed concrete placement we would not need it to be cured until 9/10/2015 so we have several alternative days for placement.

5 AEG PROJECTS WITH SIMILAR REQUIREMENTS

Four projects illustrate similar services that AEG has provided projects with similar scope and challenges presented by Gold King Mine.

5.1 GLOBEVILLE SMELTER REMEDIATION PROJECT

Project Description

The Globeville Smelter Site began operation in the 1870s, with a variety of site activities including lead, cadmium and specialty metals smelting and purification processes, as well as arsenic trioxide production, ceasing production in 2006. Over a century of handling hazardous materials and chemicals resulted in substantial environmental degradation of the site, with elevated soils and groundwater contamination associated with lead, zinc, cadmium, and arsenic.

As part of the ASARCO bankruptcy proceedings, the State of Colorado (CDPHE) has acted as a trustee of the site remediation, and Alexco Environmental Group (AEG) has been the lead environmental consultant and contractor for all site remediation activities. We have provided a wide range of services for site remediation, with total project consulting and site remediation fees exceeding $15M. AEG services provided included: water treatment plant design, construction, and operation, environmental site assessments and detailed site investigation (DSI), risk assessment, remedial planning, engineering design, permitting, reclamation implementation, and stakeholder engagement.

AEG worked with CDPHE to develop a Statement of Work which allocated the fixed funds available in the bankruptcy to the remedial priorities identified as part of prior EPA (CERCLA) and Colorado investigations and for the site ROD. Three primary remedies were implemented: 1) an active water treatment facility, which provided capture of all source area groundwater and runoff, treatment, and discharge to metro wastewater POTW; 2) a soils remedy for all source area soils, including 13 acres of low pH plant soils, 17 acres of waste gypsum materials, and scattered high arsenic soils, with the remedy including soil amendment and mixing to meet stability tests for geochemical leaching and geotechnical strength to enable redevelopment; and 3) an in situ treatment remedy for impacted groundwater using biological sulfate reduction and arsenic, cadmium, selenium and zinc precipitation.

AEG designed, constructed, and commissioned an active water treatment facility to allow demolition of the site to proceed, which included demolition of existing 20+ year old inefficient water treatment plant. The plant included ferric iron coagulation for arsenic removal, lime coagulation for other metals removal (including iron, cadmium, lead, and zinc), and automated pH and turbidity control. The treatment plant was constructed in 24 days in difficult weather (January 2011) counting from authorization to operation until the plant consistently achieved treatment for arsenic, cadmium, selenium and zinc. Discharge water of the plant was sent to the Publically Owned Treatment Works (POTW) Denver Metro Wastewater Authority, with standards consistent with the historical discharge requirements (arsenic 0.33 mg/L and cadmium 0.86 mg/L).

AEG operated this active water treatment facility in compliance with the permit requirements for 4 years (February 2011- February 2015), in which time the soil source area treatment and in situ groundwater treatment remedy was completed. These source treatment projects were so effective that active treatment was no longer needed, and AEG petitioned and CDPHE granted permission to shut down and decommission the active water treatment facility in February 2015.

The soil remedy included blending designed mixtures for each type of soil waste, including different mixtures of lime, cement kiln dust, iron oxides, cement, and soil additives. Over 800,000 yd^3 were amended, mixed, conditioned, and compacted in place, and the remaining site soils were grid sampled to confirm industrial soil cleanup criteria were achieved across the entire site. The treated soil was consolidated in a "neutralized soil area" consolidation cell, which was engineered to specifications allowing site redevelopment for industrial use.

The in situ treatment remedy included taking treated site waters from the active treatment plant, amended with soluble carbon sources (sugars and alcohols) to support in situ sulfate reduction. The injection trenches were concentrated in known source areas and in cut-off configuration to allow the entire site to achieve groundwater remediation standards in less than 4 years, reducing metals to active treatment over 99% (see graph).

Type of Contract

EPCM Fixed Price Contract with regulatory completion guarantee and separate financial assurance provided by Alexco under a special purpose entity (Alexco Financial Guaranty Corp).

Client Contact

Fonda Apostolopoulos, P. Eng. or Doug Jamison
Colorado Department of Public Health and Environment
303-692-3411 (office)
Fonda.Apostolopoulos@dphe.state.co.us

Role of firm

AEG was the general contractor who self-performed all of the construction work and which were overseen by AEG engineers to ensure project specifications (geochemical stabilization, geotechnical and groundwater quality objectives) were attained.

AEG Project Value, Globeville Smelter Water Treatment

The total dollar value of the water treatment plant was approximately $500,000 to design, build, and commission. Approximately 2,000 AEG field man hours were required to design and build the plant; approximately half of the cost of the plant was equipment or subcontracted construction cost and the remainder was AEG labor and consumables. The cost to operate the plant for 4 years was approximately $1.25 million. The total cost for water treatment plant design, build, operate, close, and decommission was approximately $1.75 million.

The total value of the Globeville Smelter cleanup project was $13.86 million, which included the water treatment project, the soils treatment and consolidation project, and the in situ groundwater treatment project. For the life of the project, approximately half of this cost was subcontractor and equipment costs, and the other half was AEG labor, consumables, and reagents.

Project status

The Globeville water treatment project is 100% complete and the site is decommissioned. The remaining project is complete with respect to all active remediation; approximately 3% of the overall project remains which includes monitoring of groundwater and preparation of site remedy documentation. AEG has been

assisting in the remedy design of the Globeville Smelter site since 2006; AEG has been under contract to provide remediation services at the site since 2010, and has approximately 3 years remaining until monitoring is complete.

Accident record for work performed by AEG

The Globeville Smelter water treatment and remediation project was performed safely, with no LTAs. Two injuries that were not LTAs occurred during AEG's remediation project, both of which were lacerations to hands. Over 20,000 hours were worked on site during the performance of this project. Several near miss observations were recorded and changes were made to task hazard evaluations and updated safe work procedures were implemented specifically with regard to working around open excavations and mobile heavy equipment.

Analytical requirements on project

During the operation of the water treatment project, the water treatment requirements widely varied due to the active demolition and remediation project. For instance, arsenic influent concentration varied from less than 1 mg/L to over 400 mg/L. Water flows varied seasonally by over an order of magnitude. AEG also successfully managed the site through the historic precipitation and flooding events of September 2013, maintaining compliance despite higher concentrations of most metals that occurred concurrent with the higher flows. For the life of the project, AEG had a 100% compliance record during the operation of the treatment facility.

AEG provided an on-site lab to monitor and troubleshoot operational issues, which included an AA instrument capable of monitoring six metals (including the metals of concern: arsenic, cadmium, lead, and zinc), turbidity and gravimetric monitoring to determine suspended solids, pH, and other field parameters. AEG also designed and implemented continuous monitoring with web-accessible tracking for water flows, pH, turbidity, and levels at multiple locations in the treatment train and for major reagents. This allowed for adjustment of treatment processes without an operator present on multiple occasions.

5.2 UNITED KENO HILL MINES: SITE CARE AND MAINTENANCE AND UPGRADED GALKENO 300 WATER TREATMENT FACILITY

Project Description

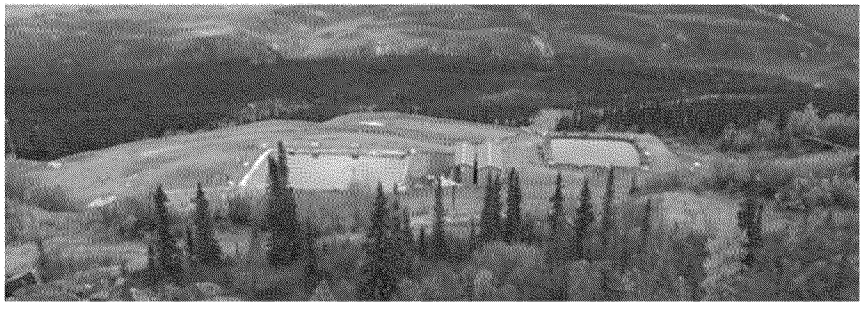
The following summarizes relevant project highlights for the UKHM project that focus on AEG's delivery of water treatment design, care and maintenance, and automation.

Since 2006, AEG has managed on behalf of its parent company Alexco Resource Corp. the contractual obligations with Aboriginal Affairs and Northern Development Canada (AANDC) to undertake closure, environmental reclamation and care and maintenance work at the Keno Hill District specifically related to historic United Keno Hill Mine (UKHM) liabilities. Care and maintenance of the Keno Hill District requires active water treatment at 5 locations (4 underground adits and 1 valley tailings) on a year round continuous basis. Together, these sites drain more than 1 million m^3 of mine water requiring treatment (approximately 250 million gallons) per year, requiring over 150 tons of lime per year for treatment. The primary contaminants of concern are cadmium and zinc, though the treatment reagent requirements are also driven by arsenic, iron, and manganese that are also present in appreciable concentration in several of the mine drainages. The Keno

Hill District covers an area over 225 km2 and includes over 35 underground adits and old mines and has similar terrain, remote location and climate to the Gold King Mine site . AEG performs this care and maintenance work on behalf of AANDC for a fixed lump sum price.

When AEG took over the UKHM care and maintenance, one requirement was to install an upgraded water treatment system for the Galkeno 300 site, which had approximately 100 mg/L zinc, 150 mg/L manganese, and 0.5 mg/L cadmium, and 100 mg/L iron. AEG evaluated treatment designs and selected a two clarifier system to provide redundancy and more operational control during seasonal flow variations. The installed system utilizes two stand-alone clarifier treatment package plants that include a rapid mix tank, flocculent tanks, and tube settlers. This system is rated for hydraulic throughput of 320 gpm, though up to 500 gpm have been treated for short periods of time during freshet. AEG also constructed a secondary sludge settling pond, which staged sludge for additional settling before final disposal. AEG demonstrated the effective use of an adjacent open pit for water treatment plant sludge storage where the sludge undergoes an annual freeze drying and draining process, yielding a stable solid sludge that can be stored on site on an interim basis for many years. This sludge handling approach resulted in improved safety, reduced heavy duty equipment requirements from pond desludging and improved employee health and safety from elimination of working around open ponds during desludging and significant reduction in heavy duty equipment on winter roads. The new water treatment plant consistently meets discharge licence standards of 0.5 mg/L zinc and 0.01 mg/L Cd.

The scope of the care and maintenance contract includes more than just water treatment, but also includes freshet spring meltwater management at the tailings facility and at diversion structures above recharge locations that affect the mine water flow. AEG has particularly focused on water management and monitoring of the historical tailings and mine recharge areas to minimize treatment costs. The previous approach was to treat the water in the ponds with lime addition and recirculation. Once the water in the tailings dam met compliance it was released, however a significant amount of water was retained in the dam every year resulting in substantial reagent and manpower requirements every year. AEG devised and implemented a siphon system to completely empty water in the valley tailings prior to the onset of winter, resulting in ample storage capacity in the spring and reducing the need for active treatment in the valley tailings. These initiatives have reduced the cost of care and maintenance to the Canadian Federal Government and Canadian taxpayer from over $2 million when Alexco/AEG took over responsibility down to a fixed price of $850,000.



The AEG scope of work and budget for the work at Keno Hill vary on a year by year basis, depending on the requirements for field assessments, special projects and engineering. Over the past 5 years, the annual work budgets have been in the range of $4.5 - $6 million including the water treatment and care and maintenance requirements.

The C&M requirements also include surface and groundwater monitoring program that entails the collection of water samples from approximately 120 sites, and operations of an on-site lab for routine water chemistry and metals analysis for the treatment sites. AEG monitors inventory and procures reagent to ensure adequate

quantities are available for water treatment. AEG has managed and maintains stand-alone radio/internet/telephone/ communication systems on site, and provides remote monitoring via internet for various treatment sites. AEG maintains mobile equipment necessary to perform on site tasks.

AEG also manages visitor and contractor orientations, site security and access, and all aspects of a health and safety program. This included development of site-specific protocols for Worker Health and Safety in full compliance with Occupational Health and Safety requirements and licenses. The contract includes required daily, monthly and annual reporting on all aspect of the project, including water treatment, other care and maintenance, monitoring, safety, and socioeconomic opportunities for locals and First Nations.

AEG also provides management of all aspects of study designs, engineering, and monitoring programs, as well as building hazardous materials assessments. AEG has performed demolition of historic mine infrastructure and building which contained multiple contaminants of concern such as lead paint, petroleum hydrocarbons, PCBs, asbestos as a way to manage and reduce high risk areas on an interim basis until final closure designs have been engineered.

Type of Contract

Alexco purchased the property from Canada as part of a bankruptcy proceedings. As part of the purchase and sale, AEG was awarded as subcontract to provide care and maintenance of the UKHM district at a recognized value of approximately $2 million per year for a fixed price that includes Alexco cost share. As part of this contract AEG also performs capital upgrades on a pass through basis. AEG is supporting the closure planning and engineering design of the treatment facilities that will be implemented after all necessary environmental assessments and permits have been obtained; these design services are being performed as part of this subcontract.

Client Contact

Mr. Jason Berkers, P.Eng.
Manager, Engineering, Type II Mines
Aboriginal Affairs and Northern Development Canada
Room 415C – 300 Main Street Whitehorse, YT Y1A 2B5
Jason.Berkers@aandc-aandc.gc.ca
867-667-3161

Role of firm

AEG oversees and self-performs all aspects of water treatment design, installation, commissioning, and O&M within the UKHM district.

Project status

AEG is in the 9th year of a long term project which is anticipated to be completed around 2024, after which time AEG will provide O&M of the remaining water treatment sites.

Accident record for work performed by AEG

The water treatment operations at Keno Hill are conducted with a crew of 5, including 1 manager, 2 operators and 2 labor support positions. Since AEG took over water treatment operations in 2006, approximately 76,500

man-hours have been incurred without a lost time accident associated with the AEG water treatment operations.

Analytical requirements on project

During the operation of the UKHM water treatment sites, the flow rates and chemistry can be widely varied due to the change in recharge and other seasonal factors. For instance, at Galkeno 300, water treatment flow rates vary by a factor of 3 (from 150 gpm up to over 400 gpm seasonally). Chemistry of treatment parameters (cadmium and zinc) vary by a factor of 2 or more. Notwithstanding this variability and the challenges with power at this remote sites, as well as extreme temperatures (0 F up to 90 F), for the life of the project, AEG had only one out of compliance event after the full Galkeno 300 system was installed.

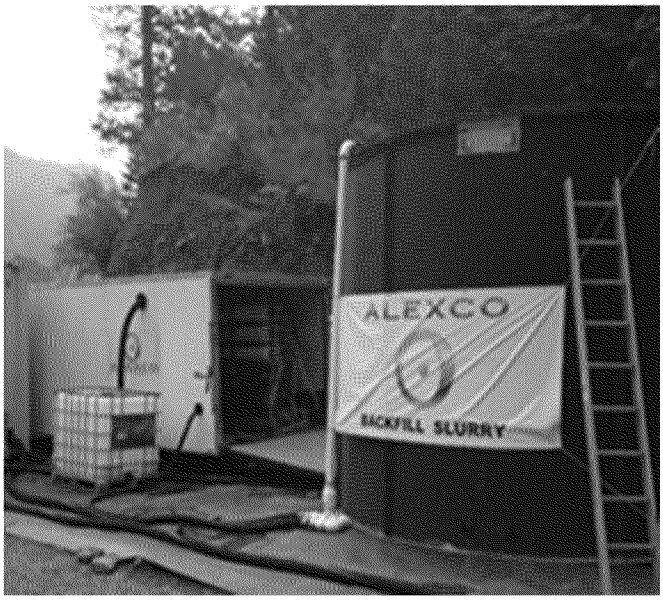
AEG provides an on-site lab to monitor and troubleshoot operational issues, which includes an AA instrument to monitor zinc, turbidity and gravimetric monitoring to determine suspended solids, pH, and other field parameters. AEG also designed and implemented continuous monitoring with web-accessible tracking and control of the system for water flows, and remote monitoring and controls for pumps controlled by treatment pH. This allows for adjustment of treatment processes without an operator present. The Galkeno 300 WTP consistently meets Zn discharge standards of <0.5 mg/l from a starting concentration of 80 – 100 mg/l.

5.3 COTTER SCHWARTZWALDER

Project Description

The Schwartzwalder mine is a deep (>2000 ft) closed underground uranium mine near Golden, CO. The mine was continuously dewatered since the 1950's until 2002. In 2013, the mine owner was ordered to dewater the mine and achieve hydraulic capture to prevent diffuse seepage to stream 3 miles upstream of Denver's water supply reservoir.

Mr. Harrington and AEG have overseen and implemented emergency water treatment solutions at the Schwartzwalder mine with oversight from EPA UIC Program, Colorado DRMS, and the CDPHE Water Quality Division. This solution involved reverse osmosis dewatering for hydraulic control, coupled with innovative strategies (owned by Alexco) for treatment of concentrated brine from the R/O process by reinjection of the brine with biochemical amendments into the underground mine pool. The result at this mine pool was a 90% reduction in dissolved uranium,molybdenum and selenium concentrations within 8 weeks (May – July 2013). The treatment system involved the design and construction of an underground submersible pumping system that AEG installed to deliver and recirculate mine water to the treatment plant. The treatment system is constructed within mobile treatment containers that were designed, built and commissioned in less than 4 weeks. A Webmaster automation and control system allows real-time monitoring of process control metrics including flowrate, pH, pressures, and reagent tank levels and operators monitor the system performance on hand held devices. Alarms alert the remote operator to conditions that can be immediately addressed.



Type of Contract

EPCM Fixed Price Contract with performance guarantee and separate financial incentive targets for technical and schedule performance. Standby fees for plant readiness and restart upon client request.

Client Contact

Ken Mushinski, Cotter Corporation.

Role of firm

AEG was the general contractor who self-performed all of the design and construction work and which were overseen by AEG engineers to ensure project specifications were attained.

AEG Project Value

The total dollar value of the water treatment plant was approximately $850,000 to design, build, and commission.

Project Status

The Schwartzwalder treatment plant is on a standby ready mode to resume mine dewatering and treatment upon the request of the mine owner. Additional site activities to advance the property to final remediation and AEG has been under contract to provide ongoing consulting and water treatment strategies for the past 3 years.

Accident record for work performed by AEG

The Schwartwalder water treatment project was performed safely, with no LTAs. Over 9,600 hours were worked on site during the performance of this project.

Analytical requirements on project

AEG provided an on-site lab to monitor and troubleshoot operational issues, which included routine monitoring of pH, flowrate and pressure. AEG also designed and implemented continuous monitoring with web-accessible tracking for water flows, pH, turbidity, and levels at multiple locations in the treatment train and for major reagents. This allowed for adjustment of treatment processes without an operator present on multiple occasions.

5.4 BREWERY CREEK MINE

Project Description

The Brewery Creek Mine, located 55 km. east of Dawson City Yukon was an open pit heap leach mine that operated from 1996 – 2001. The mine ceased active operations in 2001 due to low gold prices. AEG was responsible for care and maintenance of the mine during the transition from shutdown through closure, permitting the reclamation and closure plan, completing physical reclamation of the mine including dismantling and salvage/marketing of assets, recontouring and revegetation of waste dumps and the heap leach pad, construction of soil covers, care and maintenance, design and construction of water treatment and management facilities and strategies and long-term water quality monitoring and reporting.

In addition to the overall project management of the reclamation and closure of the Brewery Creek mine, AEG was responsible for several water treatment and management requirements and strategies that were instrumental in the successful closure of the mine.

The water management and treatment requirement at Brewery Creek included the treatment and discharge of heap solution and pore water. The Brewery Creek heap was a 9.5 mcy capacity containing over 62,000,000 gallons of heap solution that required neutralization and treatment followed by discharge to the environment. AEG designed and implemented an in situ treatment system utilizing our patented technology (Patent 5,710,361 and 5,632,715) to treat a recirculating flow of 2,000 gpm. The starting chemistry of the heap solution was approximately 50 mg/l WAD cyanide and 25 mg/l ammonia. Due to the short seasons in the arctic conditions of the Yukon, it was important that the heap be treated and discharge begin before the onset of winter conditions, resulting in a tight schedule of 5-6 months. A carbon source in the form of molasses was injected along with phosphoric acid to biologically treat cyanide and ammonia within the heap. Within 90 days, the heap effluent was within direct discharge standards as outlined in the water license permit and discharge directly to the receiving environment was possible. The system utilized and incorporated existing piping, tanks and pumping systems to reduce capital costs.

Secondly, AEG designed and constructed a cyanide destruction and metals precipitation plant that was necessary as an interim contingency treatment system as a backup to the primary heap treatment process. The plant included the use of floating mixers to provide retention and mixing for destruction of cyanide from a feed concentration of approximately 50 mg/l down to a discharge standard of 0.5 mg/l WAD cyanide. The plant was capable of treating 1,000 gpm of heap effluent and was designed to incorporate current water management features associated with the heap leach system in an effort to reduce capital costs. Hydrogen peroxide was used to destruct cyanide and caustic solution was used to maintain the pH at optimal conditions. The plant was constructed and commissioned to demonstrate its effectiveness and then placed on standby during the heap treatment process as a requirement by the regulatory authorities during the heap decommissioning phase.

A third innovative water treatment and management approach implemented by AEG at Brewery Creek was the design, construction and commissioning of a biological treatment cell (BTC) for use as a passive water treatment system. The BTC involved the reconfiguration of an existing 3,500,000 gallon lined containment pond into a treatment cell by constructing a collection and infiltration piping network for heap effluent. Clean gravel was hauled and placed into the bottom of the pond to act as a growth substrate for biological activity. A passive molasses and alcohol injection system was designed and installed to provide a source of carbon for biological activity and metals reduction. The BTC was commissioned and then put on standby as a further contingency measure for the long term discharge of the heap. After 12 years of heap treatment, the solution

from the Brewery Creek heap continues to meet direct discharge to the environment and does not require the use of the contingency measures that were part of the overall approval of the closure plan.

Type of Contract

AEG performed the scope of work at Brewery Creek through a fixed monthly fee for providing project management, engineering, supervision and environmental monitoring requirements. In addition, project performance milestones and bonus incentives were built into the project for key milestones and technical/schedule achievements.

The budget for the Brewery Creek mine closure project was $7 million over a two year seasonal period (May – Oct).

Client Contact

Susan F. Neale
(Former CFO Quest Capital – owner of Brewery Creek Mine during the work period)
Sneale3@gmail.com
604-488-9029

Role of firm

AEG provided the technical and operational resources for projec t management, contractor supervision and oversight, permitting and regulatory management, procurement, cost tracking and corporate reporting requirements.

Project Status

The Brewery Creek site is currently in a closed condition and A EG is consulting for the site owner to maintain compliance with the current Water License and complete baseline studies and regulatory applications for potential reopening.

Accident record for work performed by AEG

Over the course of a 2 year seasonal project (May – Oct, 2003-2004), the work was completed by AEG personnel overseeing specialized subcontractors for civil and mechanical tasks. Approximately 53,000 man-hours were worked during this period with no LTA. There were 4 first aid incidents recorded.

Analytical requirements on project

During the operation of the water treatment and management site s, analytical requirements on a daily basis included pH, flow, conductivity and cyanide concentrations. Th ese requirements were achieved on site using standard analytical techniques.

6 HEALTH AND SAFETY

AEG is committed to the concept of safety in the workplace, and believes that the personal welfare of each employee is of primary importance.

As the Technical Manager and Proposal Proponent, AEG has developed, and maintains a comprehensive Health and Safety Program in accordance with industry standards, and in compliance with legislative requirements. This program includes policies and procedures that will provide for the protection of personnel, the effective and appropriate use of equipment, and non-destructive use of the environment. Management will provide all required equipment and training in order to ensure that employees and sub-consultants are equipped to carry out their duties safely and effectively. Employees at every level as well as sub-consultants are responsible for, and accountable to, the company's overall safety initiatives. Management encourages all employees to actively contribute to the ongoing development of the Health and Safety Program.

With regards to fieldwork, AEG has written Safe Job Procedures (SJPs) and Safe Work Practices (SWPs) that are critical components of the control measures required for hazardous tasks performed as part of routine work undertaken by AEG employees and sub-consultants. SJPs provide step by step instructions on how to perform a specific job safely and efficiently, whereas as SWPs provide a more general guideline on how to safely perform tasks for which no standardized operating procedure exists. If an employee or sub-consultant is requested to perform a task for which no SWP or SJP exists, a supervisor or Project Manager will be consulted, and assurance should be made that hazards are correctly identified and documented before work commences.

AEG has developed SJPs and SWPs for most of the common hazardous activities employees are required to perform. These have been developed in compliance with all applicable legislation including Federal, Territorial and Municipal legislation, OHSA and MSHA regulations. The Health and Safety Co-ordinator and Management are familiar with these documents, and reference is made to them any time a new job task is being planned.

SJP and SWP identify the required training and personal protective equipment (PPE) that employees and sub-consultants are required to have before undertaking a work related task, and these procedures and practices must be reviewed and understood by all field staff. It is the responsibility of employees and sub-consultants to ensure that personnel do not operate equipment without the proper training and instruction. Personnel must demonstrate that they are proficient in the use of specific equipment and PPE as part of their New Worker Orientation, and as part of their on-the-job training. AEG ensures all employees are provided with job-related safety training opportunities.

It is the policy of AEG to regularly inspect, maintain and track all field gear, equipment, tools and vehicles, and to ensure that they are in good working condition. This will reduce damage to, and loss of, equipment and will contribute to a safe working environment. Preventative maintenance includes adherence to applicable regulations, standards and manufacturers' specifications; and procedures for identifying and removing defective gear from service.

7 BONDING

SURESCAPE

Surescape Insurance Services
7800 S. Elati Street, Suite 100
Littleton, CO 80120
(303) 225-8030 Phone
(303) 225-8034 Fax

California Office
California License: 0895668
77-564 Country Club Drive, Suite 401
Palm Desert, CA 92211

August 26, 2015

Environmental Remediation LLC
1666 Fabick Drive
St. Louis, MO 63026
Attention: Jan Rick, Purchasing

RE: Alexco Environmental Group (US), Inc.
Bonding Capacity

This letter is to confirm that our company services the surety bond program for Alexco Environmental Group (US), Inc. We have known the principals of Alexco for the past 15 years and attest to their integrity and commitment to providing quality workmanship. Alexco has a very strong resume of performance on some of the most challenging environmental remediation projects throughout the U.S. and Canada.

Surety bonds for Alexco are underwritten by The Guarantee Company of North America, rated A X (Excellent) by A.M. Best. Our understanding is that Alexco is proposing to construct an interim water treatment system near the Gold King Mine in Colorado. Bonding for this contract, if awarded, would be for the construction phase only with any O&M operations being awarded in a separate unbonded O&M contract. We understand this project is in the $1 million to $2 million dollar range.

Please note that underwriting and approval of individual bonds for Alexco is subject to favorable review of the contract documents, bond forms and verification of financing for private projects. Execution of performance and payment bonds is a matter between Alexco and The Guarantee Company of North America and no liability is assumed to third parties or to you if for any reason we do not execute bonds for a particular project.

We are proud to work with Alexco Environmental Group and are confident you will be pleased with their performance as part of your project.

Sincerely,

Doug Rothey
President

ATTACHMENTS A,B AND C

Attachment A
GOLD KING INTERIM WATER TREATMENT SYSTEM
AND
PROPOSAL ACKNOWLEDGMENT

To:	Environmental Remediation LLC	**From:**	Alexco Environmental Group US
	1666 Fabick Dr.		12150 E. Briarwood Ave Suite 135
	St. Louis, MO 63026		Centennial, CO 80112
			Joe Harrington (720) 883-6700

Site Name:	Gold King Mine Release GK8-77
Location:	Silverton , Colorado

The Subcontractor proposes to provide all equipment, labor, materials, and equipment necessary for the scope of work provided above and per Request for Proposal G8-8-77-001 and all attached drawings and specifications relative to the terms and conditions provided for the consideration of the bid prices provided herein on the pricing schedule.

The Subcontractor agrees they have examined the RFP and the extent of the scope of work, have examined the provided drawings, specifications, attachments, and examined and understands all existing local conditions relative to site access, city codes and permits, hazards, labor, and any other conditions affecting, or which may be effected by, the scope of work.

Joseph G Harrington

(Signature)

8/26/2015

(Date)

Note: All charges, including up to five required onsite meetings for both superintendent and senior engineer, anticipated to be part of completion of the scope of work, should be included in the above bid. These charges include such items as all applicable taxes, license fees, handling fees, etc.

Unbalanced bids, as determined through comparing bids to distribution of historic costs using the same technology, will either be returned for clarification or removed from consideration, at the sole discretion of ER.

Please refer to RFP# GK8-77-001 regarding correspondence to your quotation. Any questions please contact the representatives below. Bid Due date defined within RFP.

ffi

	Name of Subcontractor	Intended Service	Percentage	Dollar Value
			2 %	$31,000
			<1 %	$10,000
		Purchase	12 %	$200,000
		Purchase	18 %	$320,000
		Purchase	5 %	$90,000
		Purchase	2 %	$30,000
		Purchase	2 %	$30,000
	Baker Tank	Equipment Purchase	8 %	$140,000

RESUMES OF KEY PERSONNEL

JOSEPH G. HARRINGTON
VICE PRESIDENT-BUSINESS & STRATEGIC DEVELOPMENT

Experience

VP-Technology/Business & Strategic Development; Alexco Resource U.S. Corp (renamed Alexco Environmental Group US Inc., Denver, CO;

Mr. Harrington was a key member of the acquisition team successful in the purchase of the Keno Hill Silver District in Yukon Canada from the Government of Canada in an auction overseen by PricewaterhouseCoopers. Mr. Harrington developed the initial strategy for addressing widespread mining contamination from 45 underground mines including seven discharges requiring active water treatment operations, during the bidding process and subsequent negotiations that was accepted by the Government of Canada and of the Yukon.

Joe designed and implemented the successful treatment of the Barite Hill Mine Superfund Site pit lake during an emergency response / removal action in 2007-2008, under oversight by US EPA Region IV. The treatment process successfully created non-toxic water in-place within the mining pit lake that was previously heavily contaminated and with a pH of less than 2.0 S.U.

Joe designed and managed the implementation of an in-situ treatment process within the Zona Satelite of the Quiruvilca Mine, La Libertad District, Peru. This successful project demonstrated that agricultural byproducts of the surrounding farms and processing plants could be used in a sustainable cleanup process to achieve protection of the river from the closure of the mine, without requiring perpetual collection and treatment of the mine pool.

Joe designed and constructed the replacement WWTP for the former Asarco Globe Smelter Site in north Denver. Joe also developed the new remedy proposal accepted by the State of Colorado through a decade long process involving multiple community meetings. Joe has overseen and managed the technical direction of the work, treating 600,000 cubic yards of hazardous soil (RCRA hazardous for arsenic and cadmium) and implementing in-situ groundwater treatment strategies for protection of the South Platte River. The in-situ treatment has already attained MCLs for cadmium and zinc in the down-gradient plume leaving the Site.

Joe designed and implemented the construction of a mobile reverse osmosis dewatering treatment plant for the Cotter Schwartzwalder Mine, coupled with an in-situ treatment process that successfully reduced the in-situ concentrations of uranium, molybdenum and selenium by more than 90% in the very large mine pool.

Joe has managed and implemented mine pool pretreatment and mine water treatment sludge stabilization projects at the Platoro Mine six air miles from Summitville since 1999 and annually since 2006 for both Green World Science and for Alexco.

Professional History

May 1014 - Present, Alexco Environmental Group US Inc., VP-Business & Strategic Development
2007-May 1014, Alexco Environmental Group US Inc., VP-Technology & Strategic Development
2001-2006, ARCADIS, VP-Mining and Metals Business
1996 – 2007, Green World Science Inc., Chief Executive Officer & Chairman.
1987 – 1997, J.R. Simplot Company, Chemist
August 2006 – Present, Advisor to the board of the following companies:

Encore Energy Corp
Tigris Uranium
EMC Specialty Metals Corp
Energy Metals Corp (NYSE: EMU)
Golden Predator Mines
Golden Predator Royalty Development Corp
Americas Bullion Royalty Corp
Till Capital Corp.

Education

Graduate Research in Metallurgy, 1998, University of Idaho
First year – School of Medicine, Loma Linda University
B.S. Microbiology, concentrations in Chemistry and Metallurgy, 1996, University of Idaho - *Magna Cum Laude*.

Professional Memberships

Society for Metallurgical Engineers (SME)
Barry Goldwater Fellow

Training and Certifications

40 hr HAZWOPER
MSHA 5000-23 Certificate

Conferences and Workshops as Speaker

Northwest Mining Association annual meeting, 1991 – 1997 (Grand Prize for poster presentations)
American Water Works Association - Pacific Northwest Section, invited presenter – May 1995.
UMass Symposium, October 2004
Tailings and Mine Waste Conference, Fort Collins, Vail.
Mining Americas Summit, Denver, CO – 2009-2014.
Mining Summit, Hermosillo, MX – 2006.
Invited Delegate for drafting the Uranium in Groundwater chapter for Quintennial Edition of the Redbook of the International Atomic Energy Agency, June 2004.
Invited Delegate & Speaker, Mining and Insurance Conference, London England March 1-5, 2003.

Mr Joseph G. Harrington, Biohydrometallurgist. Joe joined the Alexco team in 2007 as the VP for Technology and Strategic Development.

VP-Mining and Metals Business; ARCADIS; Highlands Ranch, CO; 2001-2006
As Vice President of ARCADIS Mining and Metals Business Joe oversaw the implementation of all mining and metals projects, the conceptual design and technology implementation process, and implemented policies for ensuring customer satisfaction and quality assurance.

- Mining and Metals Technology group won more than $100 million of contracted business, including work for Lockheed Martin (The Dalles Oregon aluminum smelter), Merck Merced CA, PG&E Hinkley and Topock CA.
- Achieved attainment of global targets for cross-selling of metals immobilization services to markets in Europe and South America.
- Oversaw the implementation of large project contracts for sister companies in France, Belgium, Czech Republic, Chile, and Argentina.

U.S. Patents

Joe Harrington is the inventor of Alexco's patented Green World Science Technology and holds rights to numerous US Patents also issued throughout 23 countries. These patents are for the immobilization of metals in soils, earth materials, affected groundwaters, treatment of pit lakes, and the prevention of acid mine drainage from waste rock from underground mines. These patents include

5,710,361: "In-Situ Treatment of Waste Stacks, Soils or Earth Materials to Immobilize Metals Contained Therein"

6,196,765: "Inhibiting Acid Mine Drainage by Displacing Oxygen in Rock Heap"

5,632,715: "In-Situ Immobilization of Metals In Waste Stacks and Waste Stack Affected Zones"

6,350,380: "In-Situ Immobilization of Metals In Density-Variant Water Bodies"

6,435,769: "Gas Phase Modifications" ... to inhibit acid rock drainage and to treat potentially mobile contaminants

7,011,756: "In-Situ Immobilization of Heavy Metals In Density-Variant Water Bodies" Pit Lakes and Underground Mine Pools

Peter Johnson

Peter Johnson holds a B.Eng. in Aerospace Engineering from Carleton University in Ottawa, Ontario and brings demonstrated accomplishments in operations management and planning, execution of reclamation and closure plans, site management and environmental services. Mr. Johnson was Site Manager of the Brewery Creek Mine during the reclamation and closure period and is responsible for providing project and site management for AEG's environmental remediation and services projects at the Keno Hill District.

Chronological Work Experience

Alexco Environmental Group Inc., Elsa, Yukon
Project Manager/Site Manager– Keno Hill District, 2012 – current

- Responsible for management of care and maintenance program at Keno Hill Mine including supervision, cost budgeting, interface and management of all contracts and contractors, scheduling of site activities, regulatory interface and reporting, environmental management and compliance.
- Responsible for oversite of water treatment upgrades and optimization activities.
- Responsible for the installation of in situ water treatment projects.
- Responsible for the oversite and upkeep of surface water diversion ditches needed throughout the district.
- Responsible for over site of district projects including proposed power distribution upgrades, power factor correction studies, mill optimization projects, underground electrical surveys, and review of new process plant engineering
- Responsible for construction of Onek waste rock containment facility including the site preparation, and membrane installation

Alexco Keno Hill Mining Corp., Elsa, Yukon
Mill Manager– Keno Hill Mine, 2011 – 2012

- Responsible for the safe and effective operations of the Keno District mill including direct supervision of 40 employees.
- Responsible for management and over site of Process Mill operations including process optimization, tracking costs, preventative maintenance program.
- Responsible for construction of dry stack tailings facility including the site preparation, membrane system installation, tailings placement and expansion

Alexco Keno Hill Mining Corp., Elsa, Yukon
Project Manager– Keno Hill Mine, 2010 – 2011

- Responsible for management and over site of the Mill construction, supervision of contractors, cost tracking, scheduling and safety protocols.
- Responsible for construction of the process pond for the Mill including over site of earthworks as well as membrane installation.

Alexco Keno Hill Mining Corp., Elsa, Yukon
District Engineer – Keno Hill Mine, 2006 – 2010

- Responsible for management of care and maintenance program at Keno Hill Mine including supervision, cost budgeting, interface and management of all contracts and contractors, scheduling of site activities, regulatory interface and reporting, environmental management and compliance.
- Responsible for water treatment upgrades and facility installations including water treatment clarifier systems as well as retention/holding ponds.
- Responsible for the installation of waste rock storage containment structures as well as hydrocarbon containment structures.

Viceroy Minerals Corp., Dawson City, YT
Site Manager- Brewery Creek Mine, 2004 - 2006

- Responsible for all site activities and reclamation and closure work at the Brewery Creek Mine. Duties included supervision, cost budgeting, interface and management of all contracts and contractors, scheduling of site activities, regulatory interface and reporting, environmental management and compliance.
- Brewery Creek reclamation and closure consisted of demolition, salvage and shipment of all remaining site assets and buildings, recontouring and revegetation of waste rock dumps and leach pad, environmental monitoring and reporting.

Viceroy Resource Corporation, Dawson City, YT
Maintenance Planner- Brewery Creek Mine, 1999 - 2004

- Responsibilities included maintenance planning and management for large scale open pit mining fleet including 100 tonne haul trucks, 992 loaders, Demag shovels, drills, support equipment, electrical power generation and distribution and process recovery plant.

Qualifications, Certifications and Education

- B. Sc. Aerospace Engineering; Carleton University
- EOCP- Small Water Systems Operator
- Additional CEU's in Fe and Mn removal
- Class 1 and 6 driving license w/ Air endorsement
- Front line Supervisors Provisional certificate
- WHIMIS
- TDG
- C-NRPP certified (both radon monitoring and mitigation)
- YWCHS Occupational Health and Safety Confined Space Entry level 1&2
- Yukon Energy Authorization to Enter Level 1, Substation Awareness Training
- Industrial Fire Brigade Member- Incipient Level Qualification
- Operator certification on loaders, excavators, graders, and dozers
- Project management Tools and Techniques (Yukon College)
- CFC/HCFC/HFC Control Interprovincial number YT0112 (Environment Canada)
- Komatsu Mining systems Field Training courses on Maintenance and Repair
- O&K hydraulics maintenance courses

ERIC LANCASTER, PE/P.Eng
SENIOR PROJECT MANAGER/LEAD MECHANICAL ENGINEER

Professional History

2009-Present,Alexco Resource US Corp, Senior Project Manager/Lead Mechanical Engineer

2001-2009, Plexus, Mechanical Engineer/Project Manager

Education

B.S. Mechanical Engineering, 2001, Colorado State University

Years of Experience

With Alexco: 6 Years
With other companies: 8 years

Professional Memberships

Association of Mechanical Engineers

Training and Certifications

40 hr HAZWOPER

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Mr. Eric Lancaster, BS Mechanical Engineering, Registered Professional Engineer (Colorado & Yukon Territory, Canada). Eric joined the Alexco team in 2009. His experience includes 13 years providing management and engineering services to clients in the environmental and design fields.

Experience

Senior Project Manager and Lead Mechanical Engineer; Platoro; Union Gold; Platoro, Colorado; July 2009-Present (seasonal-summers).

Designed and manage an underground mine pool treatment program and a sludge transfer system from initial concept through build and operation.

Design challenges included moving 11,100 m3 of 12% to 20% iron-hydroxide sludge 2,500 feet with a 90 foot elevation gain at an average rate of 20 L/s. The sludge was amended with a carbon source as it was transferred into the abandoned mine decline.

The design included a complex transfer system comprised of an 85kW generator, multiple dredging approaches, transfer pumps, flow meters, pressure sensors, data loggers, and other equipment.

Senior Project Manager and Lead Mechanical Engineer; ASARCO Globe Smelter-Water Treatment Plant; ASARCO Multi-State Trust; December 2010-Present.

Designed, installed, and operated a full-scale water treatment system for treating collected groundwater contaminated with cadmium, arsenic, and zinc.

The water treatment system includes a collection tank (800,000 litres), a water treatment plant rated to 5.5 L/s, and a treated water tank (600,000 litres) allowing for sampling prior to release.

During operation, water from the collection tank is continuously amended with lime slurry, ferric sulfate, and polymer before passing through a clarifier and then released to the treated water tank.

The system includes continuous pH and turbidity monitoring with adjustable set-points, thus allowing an air-actuated butterfly valve connected to relays to close and discharge back to the collected water tank or open and discharge to the treated tank based on system performance. The water treatment system also includes a remote monitoring system allowing operators access to flow rates, totalizers, pH probe readings, and tank levels 24/7 via the web. The design and construction of this treatment facility was completed on schedule and within budget during the winter in Denver, Colorado

Senior Project Manager and Lead Mechanical; Globeville-Phase I Injection System; Globeville I, LLC; Denver, Colorado; March 2011-Present.

Installed and operated a full-scale pilot treatment system for injection treatment and disposal of collected water contaminated with cadmium, arsenic, and zinc to demonstrate achievement of soils and groundwater treatment objectives pursuant to negotiation of the Consent Decree Modification for the smelter site. Design challenges included the requirement to achieve infiltration of gypsum-saturated captured groundwater into a deep trench constructed into poorly permeable soils and weathered Denver formation bedrock.

Construction and start-up involved cold weather management. Amendment of the collected groundwater with mixtures of sugars and alcohols attained the stringent treatment objective of 0.005 mg/L Cd during the year-long test program.

The project required design and building an extraction, dosing, and re-injection system which included dosing and transfer pumps, flow meters, programmable logic controller, data logger, and other equipment. Managed the operation of the water re-injection system and implemented troubleshooting and work-around strategies for unplanned events including extreme weather and the failure of the linked groundwater extraction trench design which had been constructed in 1996.

Senior Project Manager and Lead Mechanical Engineer; Bellekeno Mine; Alexco Resource Corporation; Yukon, Cananda; December 2009-July 2010.

Designed and managed as Assay Lab development program and a lime-based water treatment system modification program from initial concept to the build and operation of both.

The Assay Lab project included the layout, design, equipment selection, and build of an 800 ft2 modular lab which was built in Reno, Nevada and transported to the Bellekeno mine, Yukon for final assembly.

The Water Treatment System project included the layout, design, equipment selection, and build of an improved treatment system to address metals, suspended solids, and ammonia from the underground mine operation.

Specialized Skills

Microsoft Office: Word, Excel, PowerPoint, Project
SolidWorks & Visio - CAD